KAYLA EDDY

FIELD TRIP
Plants

Theme
Plants are an important part of the natural world and our daily lives.

Utah State Integrated Core Curriculum Topic
Standard Three: Students will develop an understanding of their environment.
Objective One: Investigate plants and plant growth.

Suggested Field Trip Locations
Any location with a variety of plants, and a stream or other natural water source

Times
All lessons are 30 minutes each

PRE-TRIP ACTIVITY
Roots, Stems, Leaves

Objectives:
Students will be able to:
a. Name at least three parts of a plant.
b. Explain the function of at least one plant part.
c. List two foods that come from plants.

Materials
Paper and crayons; felt storyboard and felt plant parts; **How Plants Got Their Parts**; "Roots, Stems, Leaves" (The Banana Slug String Band 1989); tape player.

PROCEDURE

1) Introduce *plants* as the interesting and fun topic of the upcoming field trip. Explain that plants are an important part of nature and our daily lives. Call on a few students to say one thing that they know about plants or ways that they use plants. Explain that plants, like people, have body parts that help them to do different things. Have students point to their body parts (noses, eyes, ears, legs, etc.) and ask them how each part is used.

2) Move students to their story area for a story about plants. Ask them to listen carefully and decide which parts of the story are imaginary and which parts are real. Read **How Plants Got Their Parts**, moving around the felt pieces on the felt storyboard to illustrate. After the story, reinforce that, although flowers do not really fly, or think the functions of the various plant parts are depicted correctly. Review the names and functions of the plant parts.

3) Have students stand up for a song about plants. Introduce and practice actions for the song:

Roots - Shake your feet.

Stems - Keep arms at your sides and wiggle your body.

Leaves - Put your arms out and shake your hands.

Flowers - Place your hands on your head in a flower shape.

Fruit - Twist your hands like you're holding a ball.

Seeds - Wiggle your fingers as you lower your hands to the ground.

Opposite: Turning into a plant during "Plant Power."

Six plant parts - Hold up six fingers first to one side and then to the other.

Explain that during different parts of the song they will either go through all of the actions quickly or do one action for a whole verse. Play the song "Roots, Stems, Leaves." Model actions and have students follow along. Play the song again and ask the students to listen for any foods in the song. Discuss the foods.

4) Ask students to show what they know about plant parts by drawing a plant. Tell them that they can choose any plant, but that they need to include as many plant parts as they can remember. Have students return to their desks or tables, pass out paper and crayons, and allow about five minutes for them to draw. Instruct students, on the count of three, to hold up their drawings for everyone to see.

5) Remind students that they will explore more about plants and their parts on the upcoming field trip. Go over expectations and the items that students need for the field trip.

How Plants Got Their Parts

Once there was a flower floating by itself in the sky. It was a beautiful, sweet-smelling, purple flower. (Place felt flower on blue background). The flower became thirsty, but it didn't have a mouth with which to drink or any way to get water. The flower knew that water was in the soil, but it couldn't figure out how to reach the water. The flower saw some roots in the ground that were sucking the water up. (Place felt roots on soil background and make slurping sound.) As the flower thought about how to get the water that the roots were sucking up, a stem appeared above the roots. (Place the felt stem.) The flower hopped to the top of the stem. (Move the felt flower accordingly.) The stem acted like an elevator and brought water up to the flower.

After it drank, the flower realized it was hungry. However, it didn't have any hands to grab food, a mouth with which to eat, or legs to take it to food. As the flower thought about this, it noticed leaves sprouting from its stems. (Add felt leaves.) These leaves did something very unique. They combined sunlight, air, and water and put them together to make a simple sugar for the plant to eat. (Ask students if they can make food from sunlight, air and water. Explain that people and other animals cannot do this, but all plants do.) The stem began moving food up and down throughout the plant, along with the water it was moving.

Although the food and water made the plant happy, the plant was getting kind of old and knew that it would not live much longer. It wanted to make sure there would be more plants like it in the future. As it thought about this, the flower slowly turned into a fruit. (Replace the felt flower with a felt fruit.) There were seeds inside the fruit. (Place felt seed on fruit.) The fruit eventually fell down to the ground and broke open. Some of the seeds were buried. (Move felt fruit and seed accordingly.) In time, one of the seeds sprouted and became a new plant. The cycle started all over again. (Place new felt plant sprout on felt board.)

STATION #1

Plant Power

Objectives

Students will be able to:
a. Name at least three plant parts.
b. Identify differences among plants.

Materials

Plant parts poster (a plant drawing with basic parts labeled); laminated individual plant parts; cardboard sun; cardboard bee; plant parts name tags.

PROCEDURE

1) Use the *Plant Parts* poster to review basic parts of a plant with students.

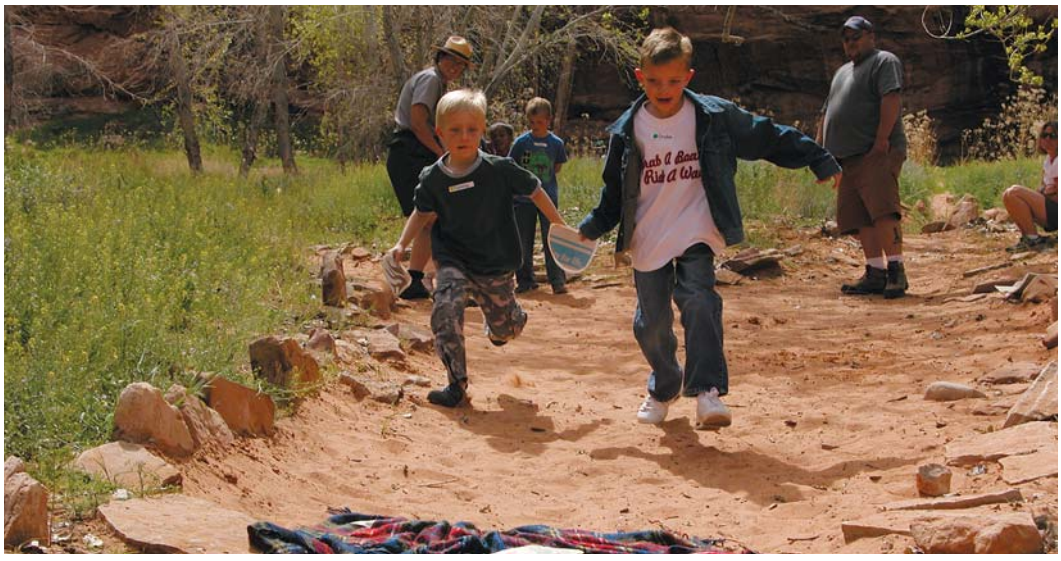
2) Inform students that they are going to turn into a big plant. Have a student volunteer sit on the ground with her legs out in front of her. Tell the students that her legs are the roots; give her the *roots* nametag to wear around her neck. Explain that roots hold the plant in the ground and bring the plant water. Have the student make a sucking noise. Choose a second student to be the stem. Have him stand directly behind the roots and move his hands up and down to represent the water that moves up and down the stem. Give him the *stem* nametag. Choose one or two students to be leaves and have them stand next to the stem. Remind the students that leaves make food for the plant. Have the leaf-students hold out their hands toward the sun, shake them, and say, "Mmm, food." Give the students the *leaves* nametag. Ask the last student to be the flower by standing directly behind the stem. Give the student the *flower* nametag. Remind students that flowers attract insects that help them create new seeds by moving pollen from plant to plant. Have the flower-student hold up the cardboard bee and make a buzzing noise. If you still have the students' attention, have them drop their roles and all act out the development of the flower: After it is pollinated, it turns into a fruit with seeds inside, and the seeds sprout to become new plants. Collect the nametags.

3) Have students sit down and out a laminated plant part to each student. As you hand out each part have the students tell you its name and its function. Have students put the plant puzzle together on the ground.

4) Go on a short walk to look at plants and their flowers. Tell students that they may smell, touch, and look at plants, but that they are not to pick them. Lead the students to interesting plants and have them gather around. Tell them to use their eyes to look for different colors, shapes, and sizes of plants. Have them use their noses to smell blooming plants. Have them use their sense of touch to feel the different parts of several plants. Talk about how all plants have the same parts even though they look different.

5) Have a "Plant Parts Relay Race." Put the laminated pieces of plants about 25 feet away from the students. Divide students into two teams and have them stand in two lines. Tell students that their goal, when it is their turn, is to listen to the plant part name that you call out, run, pick up the correct plant part, and run back to their team. Ask the first student from each team to step forward Call out the name of a plant part. When runners return, check to see if they have the right parts. Play long enough to give every student a chance to run. If there is still time, name several plant functions and have them find the corresponding plant parts (i.e. "Bring back the part that makes food.").

The "Plant parts Relay Race"



STATION # 2

Plants Thick and Thin

Objectives

Students will be able to:

a. Participate in the steps of a scientific experiment.
b. Recognize that plants grow closer together near a stream.

Materials

Poster listing the basic steps of the scientific method, poster stating your question, clipboard; marker or crayon; blank sheet of paper.

Note

Pre-select two observation areas to illustrate denser vegetation in the riparian zone and to avoid negative impact to cryptobiotic soils or plants, especially in the desert zone. If possible, choose a riparian spot where it is possible to dig a shallow hole and see water or feel moisture.

PROCEDURE

1) Tell students that they are going to do a science experiment. Ask students if they have ever done a science experiment before? Explain that when someone has a question in science, they perform an experiment to find out the answer. Point out that scientists use a specific set of steps to investigate an answer. Tell students that this is called the "scientific method." Show students the *Scientific Method* poster and have them say the words "scientific method." Go through the steps with the students using the example question "Am I going to be hungry at lunchtime?"

2) Show students the question poster and tell them that the question for our experiment is "Where do plants grow closest together around here?" Have them look around and point out possible areas. Have each student make a guess or prediction. Explain that they have already finished the first two parts of a scientific investigation: the *question* and the *prediction*.

3) Point out to the students that there are two environments in this area: desert and riparian. Define *riparian* as an area in or near a stream. Show the students each area and describe. Tell them that, for our procedure, we are going to walk along a trail in the desert environment. We will stop and spread out along the trail so that we can't touch any other students. Then, we will each take one step off the trail and plant our feet so they can't move. We will count how many plants each of us can touch.

4) Move to a pre-selected desert area out of the riparian zone. Have students spread out and then freeze. Model a procedure of keeping their feet planted and counting how many plants they can touch. Have all the students count with you. Tell students that if a spiny plant is within their reach, they may count it without touching it. Let each student take a turn touching his surrounding plants and have all the other students count with him. Record the count for each student. After the last student has counted their plants, count your tally marks as a group. Students should count by fives.

5) Have students follow you to the pre-selected area of thick growth in the riparian zone. Do not mention that this area is closer to the stream; allow students to make this observation later. Have students spread out and freeze as in the last exercise. Repeat the same method of counting and recording numbers. After the last student has counted his plants, count your tally marks as a group. Students should count by tens.

6) Compare the plant numbers for the two areas and discuss the *results*. Ask students why more plants grow in the second area. If appropriate, dig a shallow hole in the sand until you hit water or moist sand. If possible without impact, return to the first area and dig a shallow hole to demonstrate the lack of water in this area. Reinforce that the roots of plants near the stream need to be in wet soil to survive. Tell students that the last part of an investigation is a *conclusion* and that our *conclusion* might be that more plants grow where their roots can reach water.

7) Discuss differences between the plants growing in the two count areas, especially that the plants near the stream are taller and greener. Explain that plants growing near the stream would wither up and die if they lived in the desert environment and that desert plants have special ways of conserving water. Reinforce that even the desert plants, like all life, need some water to survive.

8) Very briefly introduce two to four riparian plants to the students, giving the plant names and ways of recognizing them. Play a tag game in which you periodically call out the name of one of the riparian plants to be base. Allow students to run as in a regular tag game if this is safe in the area; if it is not safe, demonstrate and play a fast-walk tag game.

STATION #3

Blowin' in the Wind

Objectives

Students will be able to:
a. Name three ways seeds are dispersed.
b. Describe at least one benefit of seed dispersal.

Materials

Felt animal cutouts; a variety of seeds; bag of wind-dispersed seeds (dandelion, cottonwood, milkweed, etc.); coconut; jar of unusual seeds.

PROCEDURE

1) Have students imagine the overcrowding there would be if all seeds dropped straight down from the parent plant. Describe seed dispersal as a plant adaptation. Discuss the environmental conditions that a seed has to live with in the high desert of southeastern Utah.

2) Show seeds that have different methods of dispersal and discuss the four primary methods: wind, hitchhiking on animals, floating on water, and passing through digestive systems of other animals. (The last method provides not only transportation, but fertilization as well).

3) To demonstrate wind dispersal, place a wind-dispersed seed in each student's hand. Have students hold their hands tight until you give the word. On a signal, have students open their palms and either hold their palm up in the wind or blow on the seed (if there's no wind). Count the number of seeds on the parachute-like head of a seed. Ask students how the wind helps tumbleweeds disperse their seeds.

4) To demonstrate seed dispersal through hitchhiking, give each student a flannel cutout animal. Walk around the immediate area for a few minutes and have students catch seeds in the "fur" of their animals. Inspect and discuss the seeds that were caught (the best hitchhikers).

5) Show students the coconut and ask them how they think it travels. Show them the husk that helps it to float thousands of miles across the ocean. To demonstrate water dispersal, move to the water's edge. Ask students to do a science investigation to answer the question: *Which seeds will float?* Give each child a seed. Have each child observe her seed and predict whether it will sink or float. On a signal, have all the students drop their seeds in the water. Watch to see which seeds float and compare the results with their predictions. Ask students what physical features helped seeds to float. Point out that scientists, like the students, often work together as this group just has, in order to gather more observations or data to answer their questions.

6) Review the ways that seeds disperse by showing the jar of unusual seeds. Ask students how they think each seed travels and why. Does the seed have hooks or wings?

EXTENSION

In small groups, have students create and act out stories of seed dispersal. Start by telling them a sample story, such as one of a coyote eating a seed and it later growing into a beautiful small tree near a stream.

Investigating seed dispersal in a stream

WHOLE-CLASS ACTIVITY

Crawling Inside

Objectives

Students will be able to:

a. Explain the functions of the roots, stem, leaf, and flower.

b. List four plant parts.

Materials

20-foot rope; shoebox with a cardboard flower pasted onto it and a slit in the middle of the flower; two big cardboard cut-out leaves; rope root network; 7 buckets with a big label on each (*sun, air, water* (1ea.), *food* (2)); blue & yellow food coloring; 7 sponges; 12 small clear plastic cups; 3 small ladles; paper bees with paper clips on them; 5 fishing poles with magnets in the place of hooks; yellow cardboard cut-out *pollen* circles; whistle; at least 8 gallons of water.

Note

Set up in advance a giant plant with four stations at the locations of the roots, leaves, stem, and flower. Use the 20-foot rope for the stem, the flower shoebox at the end of the stem, the big leaves near each other on the stem, and the network of roots at the other end of the stem. Place a *water* bucket with just a few inches of clear water in it within the roots network. Place sponges and a full *water* bucket just outside the roots. Place six clear plastic cups at the stem. Place four buckets, labeled *air, sun, water* and *food*, at the leaves. Fill the *air* bucket with water dyed deep blue and a ladle and the *sun* bucket with water dyed deep yellow and a ladle. Put a few inches of clear water and a ladle into the *water* bucket. Leave the *food* bucket empty. *Air* and *sun* buckets should be away from the leaves, but in the same general area. Place an empty *food* bucket, magnetic fishing poles, magnetic bees and *pollen* circles at the flower.

PROCEDURE

1) Have the entire class stand in a big circle away from, but just within view of, the giant plant. Tell the students they are going to shrink down and go inside of a plant to learn what the plant does. Tell students they need to shrink down to the size of a drop of water. Let them act out shrinking. Direct the students' attention to the giant plant by pointing and giving them a verbal tour. Explain that they are going to become working pieces of this plant. Remind the students that each plant part has a specific job. Tell them that when we crawl inside the plant we are going to help the plant parts do those jobs. Have the instructors model their plant parts job for the class. Explain to the students that the first whistle blow means it's time to start, the second means it's time to return to the instructors with their tools, and the third means it's time to switch. Have the instructors model their jobs one more time before getting started.

2) Divide the class into four groups. Have each instructor take a group to a plant part station. Have students act out each plant part job, switching stations every five minutes.

Roots - Review the roots' job of sucking up water from the ground. Have students use the sponges to soak up water from the bucket outside of the root and take it to the bucket inside the root. Once they have the idea, have them chant, "the roots gets the water, the roots get the water," as they work.

Stem - Review the stem's job of holding up the plant and transporting water and food to different parts of the plant. Have the students fill up their cups with clear water from the bucket within the roots and take it to the *water* bucket at the leaf. Then have students fill their cups with green water from the *food* bucket at the leaves and take the cups of water to the empty *food* bucket at the flower. Then have the students return to the roots to repeat the process. Have students chant, "the stem carries water, the stem carries food." Tell students they must stay on the right side of the flower or they will run into the leaf kids.

Leaves - Review the leaves' job of making food for the whole plant. The ingredients that the leaves need are water, sun, and air. Have students put one ladle of clear water from the *water* bucket into their cups. Then have students mix in one ladle of blue water (from the *air* bucket) and one ladle of yellow water (from the *sun* bucket). The resulting green water should be dumped into the *food* bucket. As the students work, have them chant, "the leaves make the food, the leaves make the food." Tell students they must stay on the left side of the plant, or they will run into the stem kids.

Flower - Review the flower's job of making seeds. Explain to students that flowers attract bees and bees pollinate the flowers while searching for nectar. Tell students they will be using their fishing poles to catch bees. Have students trade each bee they catch to the instructor for a pollen circle. Have students put the pollen circles into the slot in the flower box, explaining that this will pollinate the flower and allow it to make seeds. Have the students chant, "the flower makes seeds, the flower makes seeds."

3) Review by having the students return to their big circle. Ask students what each plant part does? Finally, have everyone grow back into first grade size.

POST-TRIP ACTIVITY

Plants in our Lives

Objectives
Students will be able to:
a. Name at least five plants used in everyday life.
b. Describe at least three different plant parts and one food that come from each.

Materials
Survival bag filled with scrap lumber pieces, sticks, and plant foods (sunflower seeds, popcorn, fruits, onion, carrot, lettuce, potato, celery, broccoli, etc.); *The Ugly Vegetables* (Lin, 1999).

PROCEDURE

1) Review what plants need in order to make their own food (sunlight, air and water). Ask where in nature plants grow tallest and closest together (near water). Review the major plant parts and their functions.

2) Choose a volunteer to name a favorite food. To involve more students, ask those who have the same favorite food to raise their hands. Ask if the food comes from plants. If so, discuss the plants from which it comes. Repeat this exercise with a few more volunteers. With input from students, discuss other uses of plants in everyday life (i.e. clothing (cotton), tools (pencils, paper), shelter (wood for houses and schools), and medicine). Emphasize that plants have always been important to humans and that they are necessary for our survival.

3) Ask the students to imagine that we are living in the desert or in the woods without any houses or grocery stores. Tell them that we will need food, water, and shelter to survive. Discuss where water might be found. Have students suggest what we might use as shelter and for food. Print *SHELTER* and *FOOD* on the blackboard. Pull out the survival bag, telling students that it might help us with our food and shelter needs. Hand one student an item from the bag, asking her to name the item, describe whether it could be used for food or shelter, and place it on (or on a chair under) the appropriate word. Repeat with other students until all of the items in the bag have been distributed. Reinforce that all of the items come from plants.

4) Point to the shelter items and ask which plant parts are represented here (mostly or entirely stems). Put these items out of sight and erase the blackboard words. Put the food items back in the bag. Ask students to name some plant parts, printing them across the blackboard as they name them. Include *roots, stems, leaves, buds, flowers, seeds*, and *fruits*. Print *FOOD* at the middle top of the blackboard. Choose a volunteer student and hand them a food item from the bag. Ask them to figure out which part of the plant it comes from, and place it below the name of that plant part (on the blackboard railing or on a chair). Repeat with different students for all the items in the bag.

5) Have students move to their story circle and read *The Ugly Vegetables*.

References and Resources

The Banana Slug String Band. (1989). *Dirt made my lunch*. Redway, CA: Music for Little People. 1-800-346-4445. Audiotape.

Bowden, M. (1989). *Nature for the very young: A handbook of indoor and outdoor activities*. New York, NY: John Wiley & Sons.

Cornell, J. (1979). *Sharing nature with children*. Nevada City, CA: Ananda Publications.

Discovering deserts. (1989). Ranger Rick's NatureScope 1(5). Washington, DC: National Wildlife Federation.

Lin, G. (1999). *The ugly vegetables*. Watertown, MA: Charlesbridge Publishing.

Lingelbach, J. (Ed.). (1986). *Hands-on-nature: Information and activities for exploring the environment with children*. Woodstock, VT: Vermont Institute of Natural Science.

Overbeck, C. (1982). *How seeds travel: A learner natural science book*. Photographs by S. Hani. Minneapolis, MN: Lerner Publications.

Sisson, E. (1982). *Nature with children of all ages*. New York, NY: Prentice Hall Press.

Tweit, S. J. (1992). *The great southwest nature factbook*. Bothell, WA: Alaska Northwest Books.

National Park Service
U.S. Department of the Interior

National Park Service
Canyon Country Outdoor Education
2282 SW Resource Blvd.
Moab, UT 84532